

Communication between SIMATIC S5 and SIMATIC S7 via Industrial Ethernet

CP343-1 / CP443-1 and CP143 / CP1430

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Question

How do you program the functions and function blocks for data exchange between SIMATIC S5 and SIMATIC S7 via Industrial Ethernet?

Answer

The instructions and notes listed in this document provide a detailed answer to this question.

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1 Introduction

This document provides information about the examples for Industrial Ethernet communication between a SIMATIC S7 station and a SIMATIC S5 station using the LSEND/LRECEIVE service of the ISO protocol.

Chapter 2 gives an overview of the sample program.

Chapter 4 gives information about the function mechanisms of the sample program.

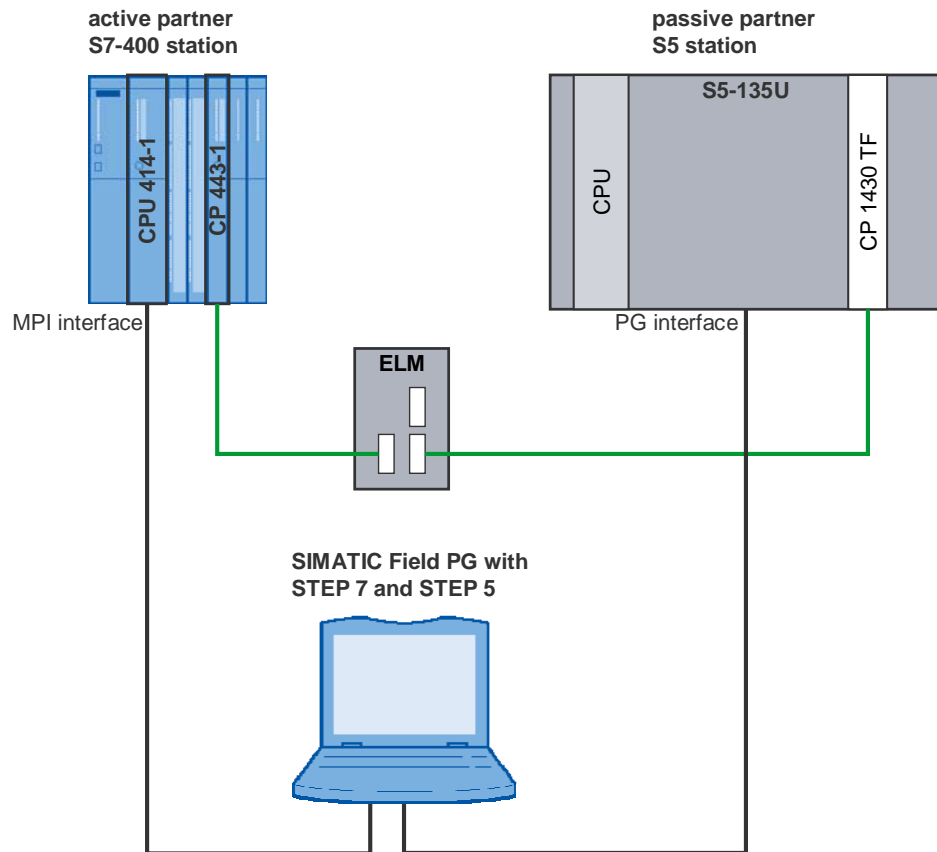
This document contains

- An overview of the plant configuration.
- An introduction to the blocks required and their communication structure.
- Details of the user programs of the S7-400 station and the S5 station.
- Information on how to use the sample programs.
- More notes, tips and tricks, etc.

2 Overview of the Sample Program

Plant configuration

Figure 2-1



Checking the function of the sample program

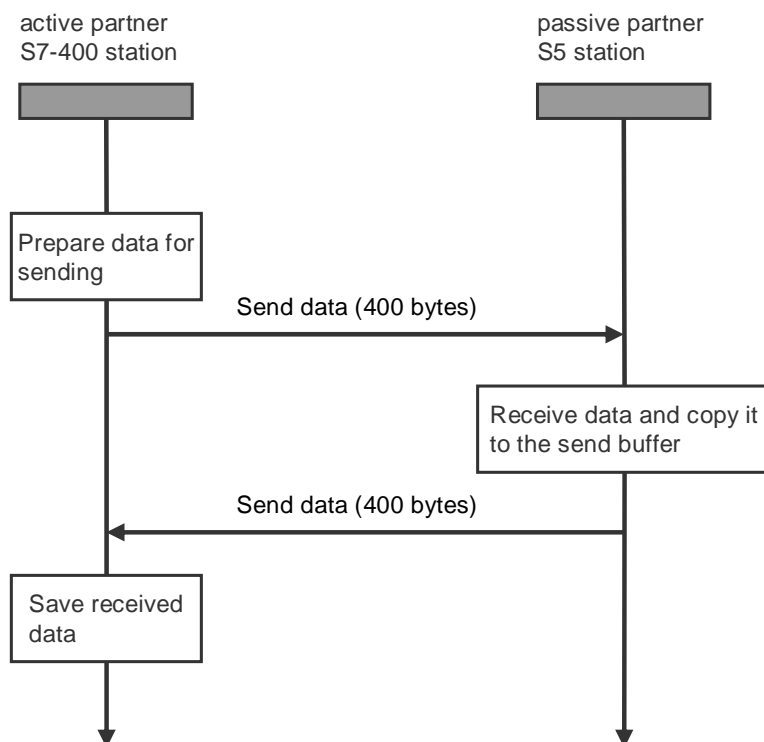
You can see whether the sample program is functioning correctly from variable table of the active S7-400 station. The variable table is included in the block folder of the STEP 7 project.

The data sent and received changes its value constantly (see chapter 5).

Overview of functions

The overview of functions shows the principal working method of the sample program.

Figure 2-2



Data communication

400 bytes of data are exchanged cyclically between the two stations involved in the communication.

Active partner and passive partner

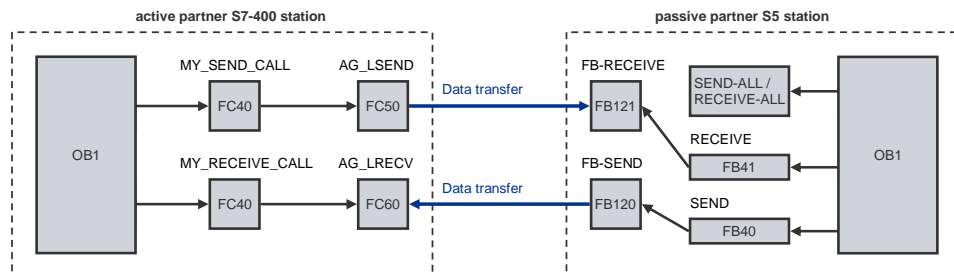
The active partner initiates establishing of the connection and sending of the new data. The passive partner receives the data from the active partner and copies it into its send buffer, i.e. after the passive partner has completely received a data block, the passive partner sends it back to the active partner.

Connection type

The ISO protocol is used in this sample program. For this you must configure a connection of the "ISO connection" type.

Program overview

Figure 2-3



User program of the active partner S7-400 station

The function FC50 "AG_LSEND" is called in each cycle to send a data block of 400 bytes in length.

The function FC60 "AG_LRECV" is called in parallel to the send job to fetch a received data block from the CP.

Once a data block has been received completely, the data is saved.

If the receive job has been completed successfully, then the first word in the send data area is incremented by 1 and the send/receive cycle starts anew.

User program of the passive partner S5 station

An FB121 "RECEIVE" is triggered in each cycle.

When the FB121 "RECEIVE" receives a new data block, the data received triggers an FB 120 "SEND" to send back the data received.

The SEND and RECEIVE ALL block runs in the background for the transfer of send and receive data.

Operating and monitoring

The operating and monitoring of the sample program is possible using the variable table provided.

The following requirements must be fulfilled for the "Monitor and modify variables" program.

- An online connection to the CPU must be established.
- The "Monitor variables" function must be activated.
- The control values must be marked as valid.

If the above-mentioned conditions are fulfilled, then you can tell that the sample program is working properly by the fact that the written and read data changes constantly.

3 Plant Configuration

This chapter gives you an overview of the configuration and the hardware and software components used to create the sample program.

3.1 Overview

Table 3-1 gives an overview of the configuration used to create the sample program.

Table 3-1

Bus system	Industrial Ethernet
Communication protocol	ISO transport protocol
Active partner	SIMATIC S7
Passive partner	SIMATIC S5
Communications processors	CP443-1 and CP1430
Services	SEND and RECEIVE with long data blocks

The ISO transport protocol is used in this sample program. Data exchange between a SIMATIC S7 and a SIMATIC S5 takes place via this protocol and the SEND / RECEIVE services for long data blocks.

In the active partner S7-400 station a CP443-1 communications processor is used for data exchange using the ISO transport protocol and the SEND / RECEIVE services.

A CP1430 communications processor is used in the passive partner S5 station.

3.2 Hardware and Software Components Used

Hardware components

The following modules in the active partner S7-400 station were used to create the sample program.

Table 3-2

Slot	Module
1	PS 407 10A
3	CPU 414-1
5	CP443-1

The following modules in the passive partner S5 station were used to create the sample program.

Table 3-3

Slot	Module
1	CPU 135 U
2	CP1430 TF

Note

The sample project has been created with a specific hardware configuration. This must be maintained to ensure proper functioning.

If you use a different configuration, with a different CPU or CP, for example, then you must change the sample program accordingly.

Required cable and other hardware

- MPI cable
- Ethernet cable: type according to medium used, e.g. AUI or ITP
- Hub or interface multiplier, ELM, SSV 104, for example
- SIMATIC Field PG or computer with RS485 interface

Software components

- STEP 7 V5.4 SP5 or higher
- NCM S7 INDUSTRIAL ETHERNET for STEP 7 V4.2 + SP1 and higher
- STEP 5 V6.65
- SINEC NCM COM for the CP1430 V5.1

4 Function Mechanisms of the Sample Program

This chapter describes how the sample program functions and which blocks are required for communication and their communication structure.

4.1 Working Method of the Sample Program

4.1.1 Data communication

400 bytes of data are exchanged cyclically between the two stations involved in the communication.

4.1.2 Active partner S7-400 station and passive partner S5 station

The initiative for sending and receiving data comes from the active partner S7-400 station.

When it receives a data block, the passive partner S5 station sends it back to the active side.

The Industrial Ethernet with the ISO transport protocol is used as network.

4.1.3 Sequence of the user program in the active partner S7-400 station

Send data

In each cycle a data block with a length of 2 bytes is sent to the passive partner S5 station.

Receive data

In each cycle a receive job is triggered and depending on the return value the data received is transferred to the receive buffer.

Increase data

The value of the data to be sent is increased by one and the send and receive cycle starts over.

4.1.4 Sequence of the user program in the passive partner S5 station

Send data

The send job is triggered when new data is received.

Receive data

A receive job is triggered in the passive partner S5 station in each cycle. When new data is received, this is transferred to the common receive and send buffer.

4.2 Functions and Function Blocks

4.2.1 Functions and function blocks in the user program of the S7-400 station

The functions FC50 "AG_LSEND" and FC60 "AG_LRECV" for data transfer are called in the user program of the S7-400 station.

Task of the function FC50 "AG_LSEND"

The function FC50 "AG_LSEND" transfers data from the specified send buffer of the CPU to the configured partner station. The pointer of the send buffer can point to a process picture area, a marker area or a data block area.

The length of the data block to be sent must not exceed 8 Kbytes.

The addresses and TSAP of the communications partner are defined during configuration and receive an ID (connection number) via which the function FC50 "AG_LSEND" sends the data.

Note

Section 4.3.4 gives a description of the input and output parameters of the function FC50 "AG_LSEND".

Task of the function FC60 "AG_LRECV"

The function FC60 "AG_LRECV" transfers data received by the configured partner station to the specified receive buffer of the CPU. The pointer of the receive buffer can point to a process picture area, a marker area or a data block area.

The length of the receive buffer must be at least as long as the longest data block to be expected.

The addresses and TSAP of the partner are defined during configuration and receive an ID (connection number) via which the function "AG_LRECV" receives the data.

Note

Section 4.3.5 gives a description of the input and output parameters of the function FC60 "AG_LRECV".

4.2.2 Functions and function blocks in the user program of the S5 station

Task of the function block FB120 "SEND"

The function block FB120 "SEND" sends the data from the specified send buffer of the AS to the specified address area of the CP.

The addresses and TSAP of the communications partners are defined during configuration of the CP.

Note

Section 4.4.2 describes the parameters of the function block FB120 "SEND".

Task of the function block FB121 "RECEIVE"

The function block FB121 "RECEIVE" transfers the data from the specified address area of the CP to the specified receive buffer of the AS. The pointer of the receive buffer can point to a process picture area, a marker area or a data block area.

The length of the receive buffer must be at least as long as the longest data block to be expected.

The addresses and TSAP of the partners are defined during configuration of the CP.

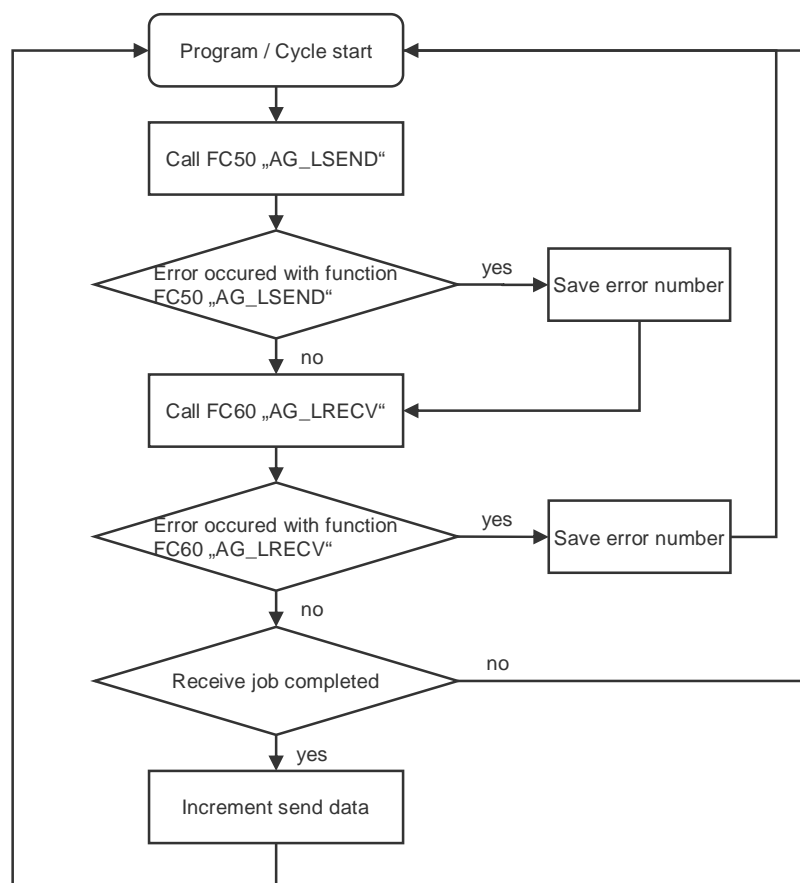
Note

Section 4.4.3 describes the parameters of the function block FB121 "RECEIVE".

4.3 Details of the User Programs of the S7-400 Station

4.3.1 Program sequence

Figure 4-1



4.3.2 Symbol table

In the symbol table you assign symbolic names to the addresses used in the user program of the S7-400 station.

The use of symbols increases the readability of the program code. The symbolic name is displayed in the program code instead of the address.

Example

The symbolic name "RECEIVE_DATA" is in the program code instead of the address MW50.

Overview

Figure 4-2 shows the symbol table used in the user program of the S7-400 station.

Figure 4-2

Symbol Editor - [S7-400 activ long (Symbole) -- SR140S iso lange Daten\SIMATIC 400 activ\CPU414-1]					
Symbol Table Edit Insert View Options Window Help					
All Symbols					
	Status	Symbol /	Address	Data type	Comment
1		AG_RECV	FC 6	FC 6	Receive Function for SEND/RECEIVE-Services SIMATIC NET CPs
2		AG_SEND	FC 5	FC 5	Send Function for SEND/RECEIVE-Services with SIMATIC NET CPs
3		FIRST_RUN	M 40.0	BOOL	first programmstep after stop->run
4		LAST_ERROR_SAVE	FC 43	FC 43	this FC is called to save the last error
5		MY_RECEIVE_CALL	FC 41	FC 41	this FC call the AG_RECV function
6		MY_SEND_CALL	FC 40	FC 40	this FC call the AG_SEND function
7		PARAMETER/ERROR_DB	DB 43	DB 43	DB for last send/receive error
8		RECEIVE	M 40.6	BOOL	wait for receivefunction call
9		RECEIVE_BUFFER	DB 41	DB 41	receive data buffer
10		RECEIVE_DATA	MW 50	WORD	for received data
11		RCV_BUFFERLENGTH	MW 48	INT	length of received data
12		RCV_ERROR	M 40.1	BOOL	indicates incorrect execution
13		RCV_NDR	M 40.2	BOOL	confirmation of execution
14		RCV_STATUS	MW 44	WORD	detailed error & status decoding
15		SEND	M 40.7	BOOL	wait for sendfunction call
16		SEND_BUFFER	DB 40	DB 40	send data buffer
17		SEND_BUFFERLENGTH	MW 46	INT	length of send buffer
18		SEND_DATA	MW 52	WORD	for sent data
19		SEND_DONE	M 40.4	BOOL	confirmation of execution
20		SEND_ERROR	M 40.3	BOOL	indicates incorrect execution
21		SEND_STATUS	MW 42	WORD	detailed error & status decoding
22		SEND_STATUS_ACTUAL	M 40.5	BOOL	display new send status

4.3.3 OB1

OB1 is the block responsible for cyclic processing of the user program. The functions FC40 "MY_SEND_CALL" and FC41 "MY_RECEIVE_CALL" are called cyclically in OB1. The functions FC40 "MY_SEND_CALL" and FC41 "MY_RECEIVE_CALL" internally call the functions FC50 "AG_LSEND" and FC60 "AG_LRECV" to send and receive the data.

Figure 4-3

OB1 : Title:

Comment:

Network 1: Title:

Comment:

```
// example for send/receive with 400 byte data

CALL "MY_SEND_CALL"

CALL "MY_RECEIVE_CALL"
```

4.3.4 FC40 "MY_SEND_CALL"

Overview

Figure 4-4

```

FC40 : Title:
Comment:

Network 1: Title:
Comment:

CALL FC 50
ACT :=TRUE // send is always activ
ID :=1 // ID of connection
LADDR :=W#16#200 // logic moduladdress of cp
SEND :=P#DB40.DBX2.0 BYTE 400 // any-pointer to send buffer
LEN :=400 // length of send-data
DONE :="SEND_DONE"
ERROR :="SEND_ERROR"
STATUS:="SEND_STATUS" // actual function status

UN "SEND_ERROR" // if no error, end
BEB

L "SEND_STATUS" // save actual (error) send status
T "PARAMETER/ERROR_DB".send_error_status

```

Description

The function FC40 "MY_SEND_CALL" is called cyclically in OB1. It internally calls the function FC50 "AG_LSEND". 400 bytes of data are transferred from the send buffer (DB40) to the configured communications partner.

When the send job has been completed successfully, the function FC40 "MY_SEND_CALL" is quitted by means of a conditional block end.

If the send job is **not** completed successfully, the status value is stored in data block DB43.

Input parameters of FC50 "AG_LSEND"

FC50 "AG_LSEND" has the following input parameters.

Table 4-1

Input parameters	Data type	Description
ACT	Boolean	Job trigger ACT = 1 → LEN bytes are sent from the data area specified with the SEND parameter. ACT = 0
ID	Integer	Connection number
LADDR	WORD	Module start address The module start address is the address of the CP. It is configured in the Hardware Configuration.
SEND	ANY	The address and length of the data area serving as send buffer are specified at the SEND parameter.
LEN	Integer	The number of bytes sent from the data area with the job is specified at the LEN parameter.

Output parameters of FC50 "AG_LSEND"

FC50 "AG_LSEND" has the following output parameters.

Table 4-2

Output parameters	Data type	Description
DONE	Boolean	Status parameters DONE = 0 → job is running DONE = 1 → job is done
ERROR	Boolean	Error display
STATUS	WORD	Status display

4.3.5 FC41 "MY_RECEIVE_CALL"

Overview

Figure 4-5

```

FC41 : Titel:
Kommentar:

Netzwerk 1: Titel:
Kommentar:

CALL FC    60
ID      :=1                      // id of connection
LADDR  :=W#16#200                // logic moduladdress of cp
RCV    :=P#DB41.DBX2.0 BYTE 400 // any-pointer to receive buffer
NDR    :="RCV_NDR"
ERROR  :="RCV_ERROR"
STATUS:="RCV_STATUS"            // actual function status
LEN    :="RCV_BUFFERLENGTH"

U      "RCV_ERROR"                // if function error, jump
SPB    err

L      "RCV_BUFFERLENGTH"        // save length of receive-data
T      "RECEIVE_BUFFER".receive_bufferlength

UN     "RCV_NDR"                  // received new data ?
BEB

L      DB40.DBW    2              // increment send data
+      1
T      DB40.DBW    2

err: L  "RCV_STATUS"              // save actual (error) send status
T      "PARAMETER/ERROR_DB".receive_error_status

```

Description

The function FC41 "MY_RECEIVE_CALL" is called cyclically in OB1. It internally calls the function FC60 "AG_LRCV". 400 bytes of data are transferred from the configured communications partner to the receive buffer (DB41).

If the receive job has been completed successfully, the data length is accepted, the data word is incremented and sent back to the configured communications partner.

If the receive job is **not** completed successfully, the status value is stored in data block DB43.

Input parameters of FC60 "AG_LRECV"

FC60 "AG_LRECV" has the following input parameters.

Table 4-3

Input parameters	Data type	Description
ID	Integer	Connection number
LADDR	WORD	Module start address The module start address is the address of the CP. It is configured in the Hardware Configuration.
RECV	ANY	The address and length of the data area serving as receive buffer are specified at the RECV parameter.
LEN	Integer	The number of bytes sent from the data area with the job is specified at the LEN parameter.

Output parameters of FC60 "AG_LRECV"

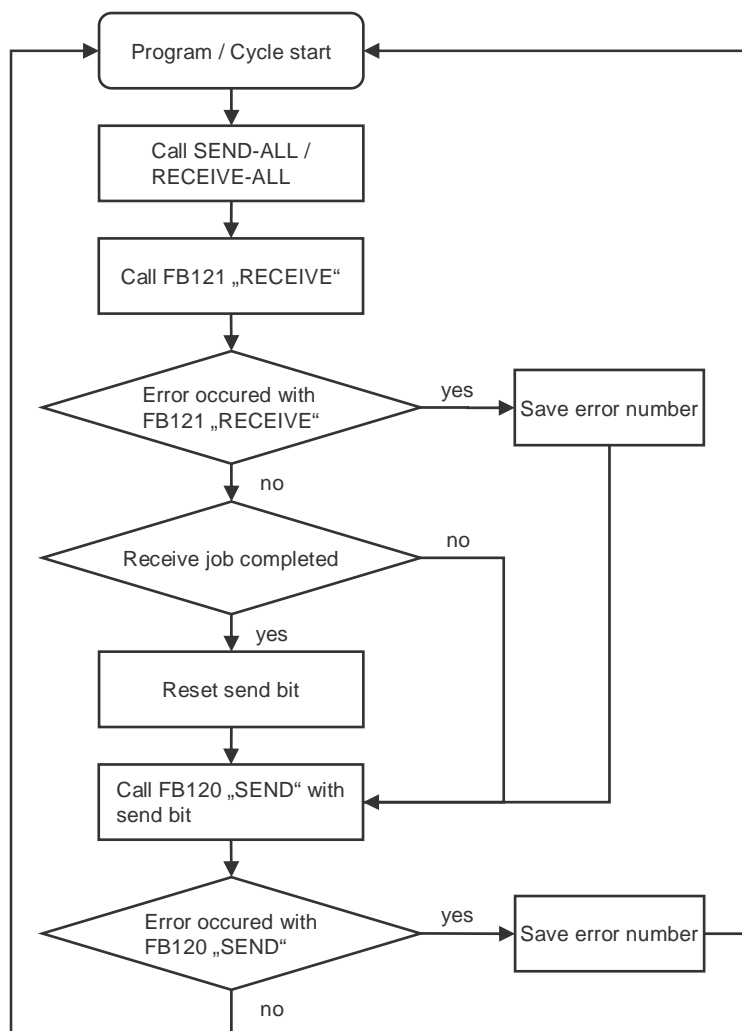
FC60 "AG_LRECV" has the following output parameters.

Output parameters	Data type	Description
NDR	Boolean	The NDR parameter indicates whether new data has been received. NDR = 1 → new data
ERROR	Boolean	Error display
STATUS	WORD	Status display
LEN	Integer	The LEN parameter specifies the number of bytes transferred from the IE CP to the data area.

4.4 Details of the User Programs of the S5 Station

Program sequence

Figure 4-6



4.4.1 OB1

OB1 is the block responsible for cyclic processing of the user program. Function blocks FB40 and FB41 are called cyclically in OB1. These function blocks internally call the function blocks FB120 and FB121 to send and receive data.

Figure 4-7

```

OB 1

Netzwerk 1
:
:           example for send/receive with
:           datalength 400 byte (iso)
:
:
:SPA FB 231           all-functions for cp1430
Name :ALL-SS 0
:
:SPA FB 41           call receive-function
Name :REC<-ISO
:
:SPA FB 40           call send-function
Name :SEND>ISO
:
:BE

```

4.4.2 Send job

Overview

Figure 4-8

```

FB 40

Netzwerk 1
Name :SEND>ISO           send to remote-station (200 word)
:
:U   M   45.7           "call-send-bit"
:SPB FB 120
Name :SEND
SSNR :   KY 0,0
A-NR :   KY 0,2           ordernumber (ncml430)
ANZW :   MW 56
QTYT :   KC DB           send buffer type is db
DENR :   KY 0,40         send buffer is db40
QANF :   KF +1           send buffer offset is dw1
QLAE :   KF +200         sendlength (200 word/400 byte)
PAFE :   MB 54
:
:U   M   57.5           anzw "data transfer completed"
:UN  M   55.0
:=   M   55.1           edge flag "data transfer
                        completed"
:
:U   M   57.5
:=   M   55.0
:
:U   M   55.1           edge flag "data transfer
                        completed"
:
:UN  M   54.0           no pafe by send
:R   M   45.7           reset "call-send-bit"
:
:BE

```

Description

The function block FB120 "SEND" is called in FB40. FB120 "SEND" transfers 400 bytes of data to the configured communications partner.

Parameter

FB120 "SEND" has the following parameters.

Table 4-4

Parameter	Description
SSNR	Interface number of the CP1430.
A-NR	Job number which identifies the S/R connection of the CP1430.
ANZW	Job status.
QTYT	ID for the send buffer type.
DBNR	Number of the data block (DB).
QANF	Offset of the send buffer.
QLAE	Length of the area to be transferred.
PAFE	Error display of the block.

4.4.3 Receive job

Overview

Figure 4-9

FB 41	
Netzwerk 1	
Name : REC<-ISO	receive data from remote-station
:	
:O M 0.0	
:ON M 0.0	
:SPA FB 121	call receive data
Name : RECEIVE	
SSNR : KY 0,0	
A-NR : KY 0,1	ordernumber (ncm1430)
ANZW : MW 46	
ZTYP : KC DB	receive buffer type is db
DBNR : KY 0,40	db-number is 40
ZANF : KF +1	receive buffer offset is dw1
ZLAE : KF -1	receivelength is joker
PAFE : MB 44	
:	
:U M 47.6	anzw "data acceptance complete"
:UN M 45.0	
:M M 45.1	edge flag "data acceptance complete"
:U M 47.6	
:M M 45.0	
:	
:U M 45.1	edge flag "data acceptance complete"
:UN M 44.0	no pafe-error
:S M 45.7	set "call-send-bit"
:	
:BE	

Description

The function block FB121 "RECEIVE" is called in FB40. With FB121 "RECEIVE" 400 bytes of data are received from the configured communications partner and transferred to the receive buffer.

Parameter

Parameter	Description
SSNR	Interface number of the CP1430.
A-NR	Job number which identifies the S/R connection of the CP1430.
ANZW	Job status.
ZTYP	ID for the receive buffer type.
DBNR	Number of the data block (DB).
ZANF	Offset of the receive buffer.
ZLAE	Length of the area to be transferred. If the ZLAE parameter has the value "-1", the length is determined when the data is received.
PAFE	Process picture error during processing of the function block FB121 "RECEIVE".

5 How to Use the Sample Program

You use the variable table supplied with the user program of the S7-400 to operate the sample program.

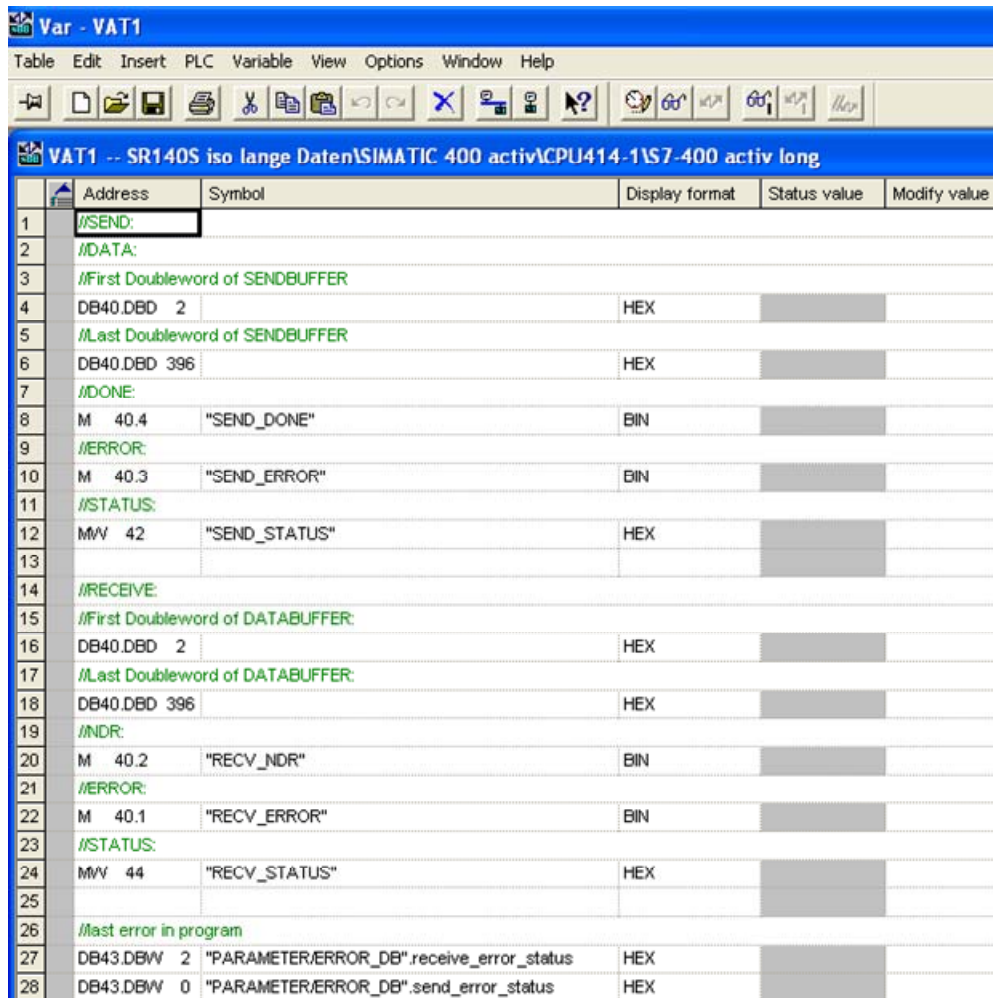
Opening the variable table in the user program of the S7-400

Table 5-1

No.	Action
1.	Use the MPI cable to connect the SIMATIC Field PG to the MPI/DP interface of the S7-400 CPU.
2.	Open the SIMATIC Manager and navigate in the project window to the block folder of the SIMATIC 400 station.
3.	In the block folder you double-click the variable table "VAT1".
4.	In the variable table you establish a connection to the S7-400 by means of the menu <code>Target system → Establish connection to → Configured CPU</code> .
5.	In the variable table you select the menu <code>Variable → Monitor</code> to control and monitor the defined variables.

Variable table

Figure 5-1



	Address	Symbol	Display format	Status value	Modify value
1		//SEND:			
2		//DATA:			
3		//First Doubleword of SENDBUFFER			
4	DB40.DBD 2		HEX		
5		//Last Doubleword of SENDBUFFER			
6	DB40.DBD 396		HEX		
7		//DONE:			
8	M 40.4	"SEND_DONE"	BIN		
9		//ERROR:			
10	M 40.3	"SEND_ERROR"	BIN		
11		//STATUS:			
12	MV 42	"SEND_STATUS"	HEX		
13					
14		//RECEIVE:			
15		//First Doubleword of DATABUFFER:			
16	DB40.DBD 2		HEX		
17		//Last Doubleword of DATABUFFER:			
18	DB40.DBD 396		HEX		
19		//NDR:			
20	M 40.2	"RCV_NDR"	BIN		
21		//ERROR:			
22	M 40.1	"RCV_ERROR"	BIN		
23		//STATUS:			
24	MV 44	"RCV_STATUS"	HEX		
25					
26		//Last error in program			
27	DB43.DBW 2	"PARAMETER/ERROR_DB".receive_error_status	HEX		
28	DB43.DBW 0	"PARAMETER/ERROR_DB".send_error_status	HEX		

In the variable table you can monitor the values of the output parameters of the functions FC50 "AG_LSEND" and FC60 "AG_LRECV".

Data is successfully sent and received

If the data is successfully sent and received, the output parameters of the functions FC50 "AG_LSEND" and FC60 "AG_LRECV" have the following values.

Table 5-2

Output parameters	Variable at the output parameter	Value
DONE	M40.4 "SEND_DONE"	The value of variable M40.4 changes constantly between 0 and 1.
ERROR	M40.3 "SEND_ERROR"	M40.3 = 0
STATUS	MW42 "SEND_STATUS"	MW42 = 0
NDR	M40.2 "RECV_NDR"	The value of variable M40.2 changes constantly between 0 and 1.
ERROR	M40.1 "RECV_ERROR"	M40.1 = 0
STATUS	MW44 "RECV_STATUS"	MW44 = 0

The send and receive data in DB40 and DB41 changes constantly.

Errors in sending and receiving the data

If the data is **not** successfully sent, the output parameters of the functions FC50 "AG_SEND" and FC60 "AG_LRECV" have the following values.

Table 5-3

Output parameters	Variable at the output parameter	Value
DONE	M40.4 "SEND_DONE"	M40.4 = 0
ERROR	M40.3 "SEND_ERROR"	M40.3 = 1
STATUS	MW42 "SEND_STATUS"	MW42 <> 0
NDR	M40.2 "RECV_NDR"	M40.2 = 0
ERROR	M40.1 "RECV_ERROR"	M40.1 = 1
STATUS	MW44 "RECV_STATUS"	MW44 <> 0

The status value of the function FC50 "AG_LSEND" is stored in data word 0 of data block DB43.

The status value of the function FC60 "AG_LRECV" is stored in data word 2 of data block DB43.

Send data

Proceed as follows for sending data to the passive partner SIMATIC S5.

Table 5-4

No.	Action
1.	In the variable table you enter a control value of between 0 and 32767 for the variables DB40.DBD2 and DB40.DBD396.
2.	The control value entered is accepted for the variable by means of the menu Variable → Activate control values.

If the data is transferred successfully, this value is also adopted as receive value in DB41.

Closing the variable table in the user program of the S7-400

Close the variable table by means of the menu `Table → Close`.

6 More Notes, Tips and Tricks, etc.

This chapter gives you more notes, tips and tricks for the commissioning and working of the sample program.

6.1 Not Possible to Download Hardware Configuration, Connection or Blocks to the S7-400 CPU

If it is not possible to download the hardware configuration, connection or blocks to the CPU, then make the following checks and take the following measures to remedy the situation.

Table 6-1

Check	Remedy
Check that the MPI cable is connected on the SIMATIC Field PG and on the MPI or MPI/DP interface of the S7-400 CPU. If the MPI cable is not connected on the SIMATIC Field PG and on the MPI or MPI/DP interface of the S7-400 CPU, no connection can be established between the two stations.	Connect the MPI cable to the RS485 interface of the SIMATIC Field PG and to the MPI or MPI/DP interface of the S7-400 CPU.
Check the settings in "Set PG/PC interface...". The interface parameters used must be assigned to the access point of the application "S7ONLINE (STEP 7)". If the settings in "Set PG/PC interface..." are not correct, no connection can be established between the two stations.	Go to <code>Start → SIMATIC → STEP 7</code> and select the menu item "Set PG/PC interface". Under "Interface parameters used" you select the module to which the MPI cable on the SIMATIC Field PG is connected, CP5611 (MPI), for example. Apply the settings with "OK".
Open the hardware configuration. The hardware configuration in the STEP 7 project must match the configuration of the S7-400 station.	Change the hardware configuration in the STEP 7 project to match the configuration of the S7-400 station.
Check that the CPU has been completely reset.	If the CPU has not been completely reset, then do a complete reset of the S7-400 CPU.

6.2 Values of the Send and Receive Data Do Not Change in the Variable Table

If the values of the send and receive data do not change in the variable table, then make the following checks and take the following measures to remedy the situation.

Table 6-2

Check	Remedy
Check whether the Ethernet cable is connected on CP443-1 in the S7-400 station and on CP1430 in the S5 station. If the Ethernet cable is not connected on CP443-1 in the S7-400 station and on CP1430 in the S5 station, no connection can be established between the two stations. Data exchange is not possible.	Connect the Ethernet cable to the Ethernet port of the CP in the S7-400 station and to the hub or interface multiplier. Connect another Ethernet cable to the Ethernet port of the CP in the S5 station and to the hub or interface multiplier.
Check whether a plug-in transceiver is slotted on the S5 station if you are using Industrial Twisted Pair cables. If you use Industrial Twisted Pair cables without plug-in transceiver in the S5 station, no connection can be established between the stations. Data exchange is not possible.	Insert a plug-in transceiver between the Twisted Pair cable and the AUI port of the CP in the S5 station.
Check whether "Monitor variables" function is activated in the variable table.	Activate the "Monitor variable" function by means of the menu <code>Variable → Monitor</code> .

6.3 Control Values are Not Applied for the Variables in the Variable Table

If the control values for the variables in the variable table are not applied, then make the following checks and take the following measures to remedy the situation.

Table 6-3

Check	Remedy
Check whether the control values of the variables "DB40.DBD2" and "DB40.DBD396" are in the range of valid values.	Enter a control value from the valid value range of 0 to 32767 for the variables "DB40.DBD2" and "DB40.DBD396".

Note

If these notes, tips and tricks etc. for the commissioning and working of the sample program have not been of assistance, then repeat the commissioning of the sample program.